

# **Title: Global estimates of PBL depth from space-borne LIDAR**

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## **Abstract**

The planetary boundary layer (PBL) is responsible for communicating the exchange of energy, moisture, momentum, pollutants, and aerosols between the surface and the free atmosphere and is therefore crucial to many studies of the atmosphere. Unfortunately, there have historically been few observations of this important layer due to the complexity involved in its measurement. However, with the advent of more advanced satellites, global measurements of the PBL are now becoming possible.

The PBL is often characterized by a high concentration of aerosols within the layer and low level clouds capping it and these are observable from space. The Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations (CALIPSO) satellite was launched in 2006 with the intention of observing aerosols and clouds and was the first space-based LIDAR optimized for this purpose. CALIPSO observations are therefore well suited to observing the depth of the PBL. Since it was launched, CALIPSO has been making nearly continuous measurements enabling a global picture of PBL depth. We plan to present a global PBL depth product and how it evolves throughout the year. The product is able to identify deeper PBL depths in the summer hemisphere over land and deeper depths along the northern hemisphere oceanic storm tracks in winter associated with cold air traveling over warm water. Large seasonal cycles are also evident in the subtropical desert locations among other features. In addition, comparisons will be made between several estimates of PBL depth based on turbulent intensity, meteorology profiles, and aerosol profiles from the GEOS5 model.